Take advantage of what's bred into them with:

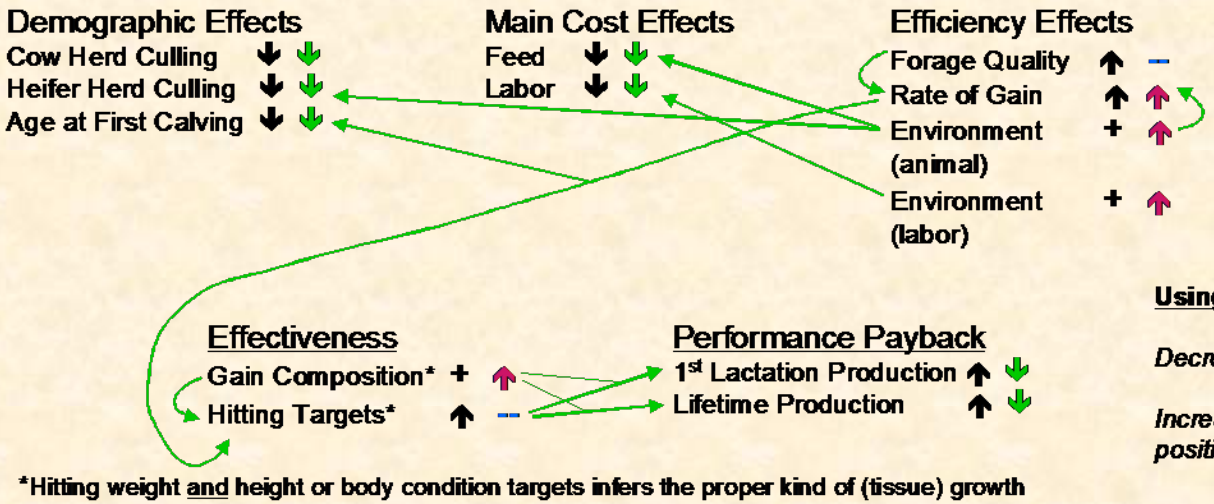
PRO-DAIRY

Targeted Heifer Growth

An easy-to-use guide where <u>you</u> determine age at first freshening

To get PowerPoint File for printing additional graph pages go to: http://www.ansci.cornell.edu/prodairy/heiftarget

Replacement Economics – an Interesting Web



Symbol Legend

- Decreasing
- Increasing
- \+ Improving
- Reduces Replacement Costs
- Increases Replacement Costs
- – is Neutral to Replacement Costs
- → but has a Positive Effect on

*Hitting weight and height or body condition targets infers the proper kind of (tissue) growth

Using Symbols to Make Sense of Replacement Economics

Simply plug in words for symbols, such as:

Decreasing cow herd culling *reduces replacement costs*

or

Increasing rate of gain *increases replacement costs, but has a positive effect on* age at first calving and hitting targets.

Practical Application of Targeted Heifer Growth for Optimal Financial Returns:

① Get mature weights or adjusted mature weights (see chart) for all cows in herd

② Based on dam's mature weight, separate heifers into small, medium or large predicted mature weight; fewer categories if cow-to-cow variation is less

③ Choose a target mature size for small, medium and large mature size heifers

④ Choose an age in months at freshening target either for all sizes or per size based on your farm specific environment constraints

⑤ Consult with Feed Rep and run diets taking into account size, average daily gain targets and accurate environmental description. Feeding a separate energy grain from protein grain allows maximum flexibility. Of course, all forages fed need to be accurately identified and analyzed. Winter environments present the greatest challenges!

⑥ Use sentry heifers to measure scheduled bodyweight and body condition (or hip height) scores. Evaluate if out of compliance and make needed adjustments. A random 20% of a group such as the "Breeding Age" heifers may give you an accurate gauge on whether you're hitting the "55% of Mature Weight" target for the age at calving you are shooting for.

Mature Weight Estimator (use multiplication factors below)	
1st Calf	1.18
2nd Calf	1.09
3rd Calf	1.04

Adjusting Mature Cow Weights for Body Condition			
BCS	**900 – 1200 Lb. Cows**	**1300 – 1500 Lb. Cows**	**1600 – 1900 Lb. Cows**
2.5	+150	+200	+250
3.0	+75	+100	+125
3.5	-	-	-
4.0	-75	-100	-125
4.5	-150	-200	-250

PRO-DAIRY

23 Month Freshening

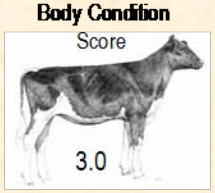
Average Daily Gains by Mature Weights for 23 Month Freshening

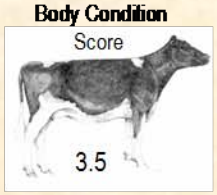
	Mature Bodyweight in Pounds										
	900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900
Birth –> Pregnancy	1.02	1.14	1.25	1.37	1.48	1.6	1.71	1.83	1.94	2.06	2.17
Pregnancy –> Calving	0.99	1.1	1.21	1.32	1.43	1.54	1.64	1.75	1.86	1.97	2.08
Last Trimester Pregnancy	2.44	2.55	2.66	2.77	2.88	2.99	3.09	3.2	3.31	3.42	3.53

Monthly Target Weights for 23 Month Freshening

Age in Months	Mature Body Weights										
	900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900
Birth	60	66	72	78	84	90	96	102	108	114	120
1	92	101	111	120	130	139	149	158	168	178	187
2	123	136	149	162	176	189	202	215	228	241	254
3	155	171	188	205	221	238	255	271	288	305	321
4	186	206	227	247	267	287	307	328	348	368	388
5	218	241	265	289	313	337	360	384	408	432	455
6	249	277	304	331	359	386	413	441	468	495	522
7	281	312	343	373	404	435	466	497	528	559	590
8	312	347	381	416	450	485	519	553	588	622	657
9	344	382	420	458	496	534	572	610	648	686	724
10	375	417	459	500	542	583	625	666	708	749	791
11	407	452	497	542	587	632	678	723	768	813	858
12	439	487	536	584	633	682	730	779	828	876	925
13	470	522	574	627	679	731	783	835	888	940	992
14	495	550	605	660	715	770	825	880	935	990	1045
15	525	583	642	700	758	817	875	933	992	1050	1108
16	555	617	678	740	802	863	925	987	1048	1110	1172
17	585	650	715	780	845	910	975	1040	1105	1170	1235
18	615	683	752	820	888	957	1025	1093	1162	1230	1298
19	645	717	788	860	932	1003	1075	1147	1218	1290	1362
20	719	794	869	944	1019	1094	1169	1244	1319	1394	1469
21	794	872	950	1029	1107	1185	1264	1342	1420	1499	1577
22	868	950	1031	1113	1195	1276	1358	1440	1521	1603	1685
23	765	850	935	1020	1105	1190	1275	1360	1445	1530	1615

Body Weights Must Always be Taken in Conjunction with either Body Scores or Hip Heights





Illustrations by Barb Spike. Courtesy of Elanco Animal Health

Average Daily Gains by Mature Weights for 23 Month Freshening

Mature Bodyweight in Pounds

	900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900
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Monthly Target Weights for 23 Month Freshening

Mature Body Weights

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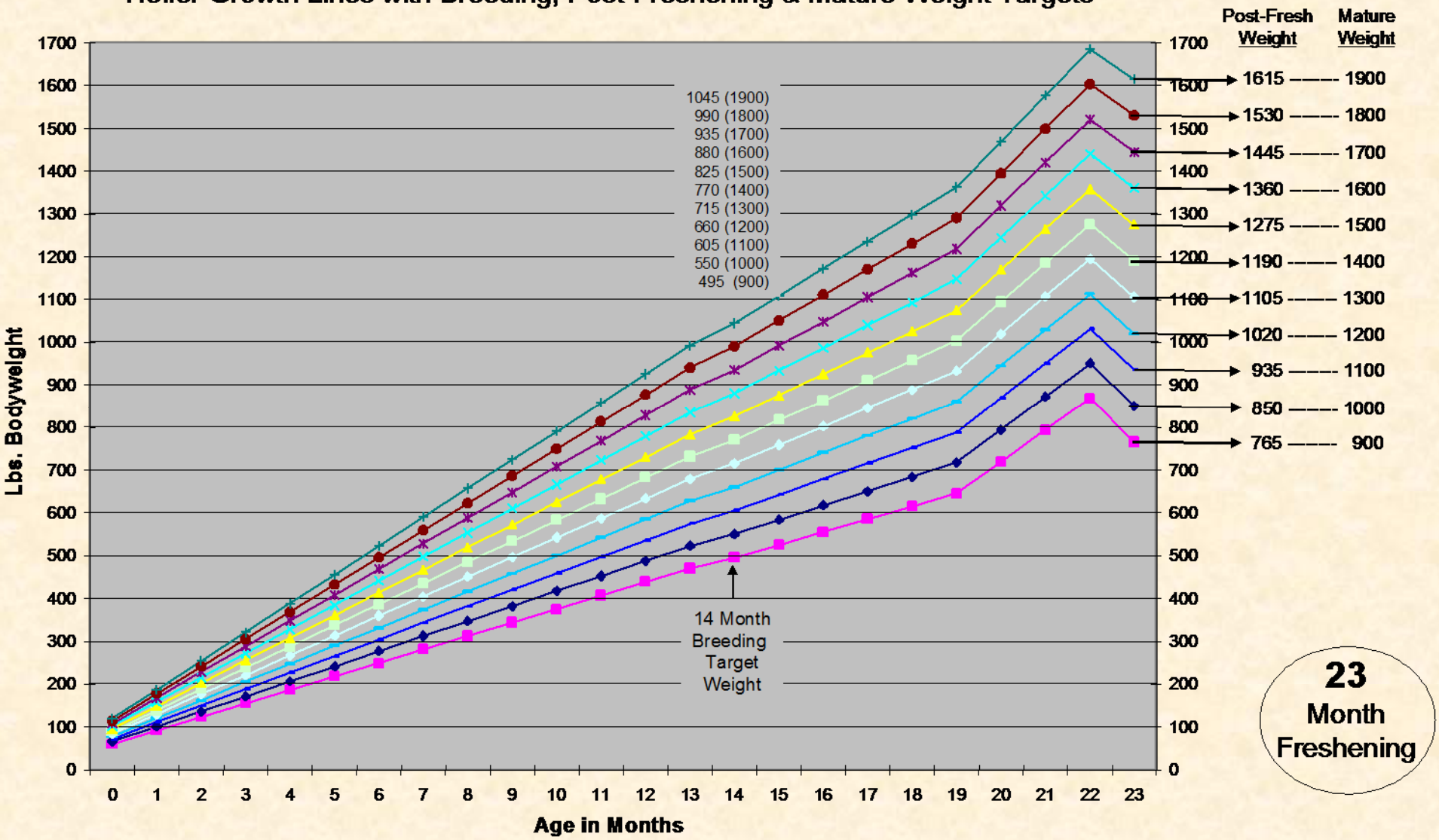
Heifer Growth Lines with Breeding, Post-Freshening & Mature Weight Targets



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Dairy Calf & Heifer Association

$3.50

Raising Quality Replacement Heifers

America's Dairy Quality Assurance Program

Milk & Dairy Beef ™
Quality Assurance Center, Inc.

Dairy Calf & Heifer Association

Raising Quality Replacement Heifers—

Introduction

Welcome! This manual is a key to the Milk & Dairy Beef Quality Assurance Program. This certification guide is distributed in cooperation with the Dairy Calf and Heifer Association (DCHA). A decision to use this program to its full potential demonstrates your commitment to producing top quality heifers that are ready to enter a milking string. A self-audit guides you in implementing "Best Management Practices (BMPs)." This process will increase performance and at the same time help reduce your costs. Finally, it helps meet the consumers' demands for proof of quality animal care, control of pathogens, environmental stewardship, and personnel development.

Quality Control Points Index

Quality Control Point #1 - MANAGEMENT FOR QUALITY IS AN IMPORTANT PART OF MY PROFIT!

Profit from quality on a dairy or on a heifer grower's operation starts and ends with a commitment by you the manager to seek quality. Unless management is committed to improving quality *(in this case, improving the quality of replacement heifers)*, little will be accomplished–by your nutritionist, your veterinarian, your financial advisor, your AI technician, or anyone else. A commitment to producing a quality replacement heifer is an important step toward improving herd health and quality milk production. Review the checklist below.

Yes	No	NA*	Best Management Practices/Standards Checklist
❑	❑	❑	I read articles written by experts on heifer raising.
❑	❑	❑	I am a member of the Dairy Calf & Heifer Association.
❑	❑	❑	I have an identification system in place that provides two permanent sources of calf/heifer identification. I use a premise identification number.
❑	❑	❑	I have a measurement system in place to evaluate the quality of the heifers I produce.
❑	❑	❑	I can readily track and validate to others the value represented in the DQA-Certified heifers.
❑	❑	❑	I have a written mission statement as well as measurable and time-bound goals and objectives.
❑	❑	❑	I use minimum standards (e.g., calving at 22-24 months) to improve quality.
❑	❑	❑	I and/or my clients have long- and short-term business goals.
❑	❑	❑	I prepare an annual balance sheet, an operating statement, and an annual cash flow.
❑	❑	❑	I have a documented process and reliable record-keeping system for tracking movement of animals.
❑	❑	❑	I have dead animals necropsied to determine the cause of death and make appropriate management changes.
❑	❑	❑	Dead animals are disposed of immediately after necropsy in a manner approved by area regulatory agencies.
❑	❑	❑	I enroll calves into a national animal identification data base when born.
❑	❑	❑	I use radiofrequency tags to identify calves and encourage source herds to do the same.

Quality Control Point #2 - QUALITY LABOR MANAGEMENT

Responsible, efficient, and profitable heifer production includes competent personnel management.

Yes	No	NA*	Best Management Practices/Standards Checklist
❑	❑	❑	I have a written job description for each employee or family member.
❑	❑	❑	All employees are familiar with our mission statement, goals, objectives, and customer service requirements.
❑	❑	❑	I assign a training partner to all new employees and have a formal printed training program for my employees to follow.
❑	❑	❑	I carefully demonstrate and explain new job responsibilities to my staff/family members.
❑	❑	❑	I have printed protocols, available for all employees and clients or customers, detailing all critical tasks and processes used in my operation.
❑	❑	❑	I provide instructions, emergency procedures, and job responsibilities in my employees' first language.
❑	❑	❑	I have a formal printed program for seeking suggestions from employees for improvements in training and business processes.
❑	❑	❑	I encourage private, individual employee evaluation at least twice per year.
❑	❑	❑	I share business results with my employees so they know how our team is doing.

MANAGEMENT TEAM REMARKS: _____

_____

NA - Not Applicable*

Quality Control Point #3 - QUALITY HEIFERS ARE PLANNED

A quality replacement program produces a strong healthy heifer ready to calve by 24 months of age. Planning quality heifers starts with the present milking string. Before breeding and during lactation are the key times to start a "quality" replacement heifer program. As a heifer grower, your clients' success starts with your clients' breeding and lactation management.

Yes/No/NA*	Best Management Practices/Standards Checklist
	Your Clients:
❑ ❑ ❑	use a mating program to minimize inbreeding, to manage genetic recessives, and to choose top AI sires to maximize the genetic potential of the next generation.
❑ ❑ ❑	participate in a milk production recording program to document each cow's individual production.
❑ ❑ ❑	have a dry cow health program with an appropriate vaccination schedule including records of when injections are given.
❑ ❑ ❑	"body score" the cows to evaluate management and to assure that they are in condition to produce thrifty, healthy baby calves.

MANAGEMENT TEAM REMARKS: _____

Quality Control Point #4 - QUALITY HEIFER CARE FROM BIRTH TO WEANING

Quality replacement heifers start by being strong calves at birth, receiving adequate quality colostrum, and then moving on to dry feed by four weeks of age.

Best Management Practices/Standards Checklist

Yes/No/NA*

Replacement Heifer Growers and Milk Producers:

- ☐ ☐ ☐ I obtain a history of health information from the source herd and consider this in the design of health care for animals under my care (BVD ear notch results, or high abortion rates at source herd farms would suggest vaccine for heifers).
- ☐ ☐ ☐ I blood test all the baby calves to check the effectiveness of the colostrum program used by my clients.
- ☐ ☐ ☐ My calves cannot touch other calves until approximately 5 weeks of age (quarantine).
- ☐ ☐ ☐ My calves have access to fresh water at all times.
- ☐ ☐ ☐ My calves are eating 2 pounds of starter for a minimum of three or more consecutive days before weaning. I key on calves not eating their starter.
- ☐ ☐ ☐ I provide adequate space per calf while on milk replacer.
- ☐ ☐ ☐ I provide calf starter by 3-5 days of age.
- ☐ ☐ ☐ My calves gain in excess of 1 pound per day (large breeds) at weaning or 0.75 pounds per day (small breeds). I use a scale or weight tape.
- ☐ ☐ ☐ I provide a coccidiostat in my calf feeding program.
- ☐ ☐ ☐ I provide bedding for my calves to keep them dry and comfortable.
- ☐ ☐ ☐ My replacement heifer program provides a high quality liquid feed (milk replacer) after colostrum is fed.
- ☐ ☐ ☐ If I use whole milk, accurate and safe pasteurization practices are followed.
- ☐ ☐ ☐ I remove extra teats from the replacement heifers before weaning.
- ☐ ☐ ☐ I dehorn the replacement heifers between birth and switching to dry feed.

The most common illness among my dairy heifers from birth to weaning is:
(Rank: 1 = OK, 2 = somewhat a problem, 3 = a problem)

Scours, diarrhea ____ Trauma ____ Respiratory problems ____ Joint or navel problem ____

Quality Control Point #5 - QUALITY CARE—WEANING TO PREBREEDING

A quality replacement heifer has one challenge between weaning and breeding—eleven months of growth! Heifers achieve puberty at approximately 60-65% of mature body weight. Hence, the sooner the heifers reach this size, the sooner they are ready for breeding.

Best Management Practices/Standards Checklist

Yes	No	NA*	
❑	❑	❑	I have a plan to minimize growth slumps right after weaning.
❑	❑	❑	My focus on replacement heifer growth includes nutrition, health, parasite control, comfort, and social factors. I measure the effectiveness of that plan.
❑	❑	❑	I routinely monitor growth by evaluating weight, height, and body condition scoring and have a management plan to control overconditioning of heifers.
❑	❑	❑	I understand the changes my heifers go through as they switch from a milk/liquid diet to become fully developed ruminant animals utilizing dry feed.
❑	❑	❑	I use calf starter before, during, and after weaning.
❑	❑	❑	I have reviewed with my nutritional consultant the ration for my replacement heifers to ensure an appropriate ration for each age group.
❑	❑	❑	I have reviewed with my nutritionist, the economical benefits of incorporating Distillers Grains (DG's) into my rations along with monitoring phosphorous, protein, and fat content.
❑	❑	❑	I have a written vaccination program to follow with all replacement heifers (IBR, Type 1 and Type 2 BVD, PI_3, BRSV, lepto, and clostridials).
❑	❑	❑	I record the date of each vaccination received.
❑	❑	❑	My replacement heifer management program includes feeding an ionophore.
❑	❑	❑	I treat replacement heifers for internal and external parasites and monitor results with a fecal test.
❑	❑	❑	I manage my facilities to provide adequate resting space, bunk space, shade, etc.
❑	❑	❑	I group replacement heifers by similar age and weight.
❑	❑	❑	I have an effective fly control program.
❑	❑	❑	I use records to assist me and cull animals that are not up to my milk producer clients' quality standards.

My records help identify heifers that are:

Quality Control Point #6 - BREEDING QUALITY HEIFERS

Payoff time is approaching. All the hard work and quality management provided will increase income to your operation–our goal is to have the heifer pregnant by 14 to 15 months of age.

Yes	No	NA*	Best Management Practices/Standards Checklist
❑	❑	❑	My records confirm that replacement heifers have a body condition score of 3 to 3.25 when bred.
❑	❑	❑	I evaluate the weight for size before breeding (48" at withers, 800# large breeds).
❑	❑	❑	To help avoid calving difficulty, I choose AI sires with calving-ease evaluations that are 7 or less.
❑	❑	❑	I have an efficient program for heat detection that I confirm with my record system. If necessary, I use heat detection tools and other synchronization programs.
❑	❑	❑	I monitor reproduction efficiency by regular pregnancy exams at 35–40 days after breeding.
❑	❑	❑	My heifers receive one or more doses of MLV IBR BVD vaccine at least 3–4 weeks prior to breeding to protect their fetus from abortion or persistent infection.

MANAGEMENT TEAM REMARKS: _____

Quality Control Point #7 - HEIFER CARE–BREEDING TO CALVING

Just because the heifer is bred, do not forget her. It is very important to keep her growing and to keep her calf growing. The payoff for quality care is close. Capture the payoff! The DQA Certified heifers are worth more to your clients, because you are providing a replacement heifer that has been certified by a veterinarian.

Yes/No/NA* **Best Management Practices/Standards Checklist**

I monitor weight of my animals to assure that:

- ☐ ☐ ☐ my replacement heifers gain 1.6 to 2.0 pounds per day after breeding.
- ☐ ☐ ☐ typically, my large breed heifers weigh 1,275 to 1,350 pounds, and the small breed heifers (Jersey) weigh 875 to 950 pounds two months prior to calving.
- ☐ ☐ ☐ body condition scoring results are 3.5 to 3.75 average at calving.
- ☐ ☐ ☐ I examine the feet of my heifers to detect defects and trim hooves prior to calving (when needed).
- ☐ ☐ ☐ I seek to avoid mixing replacement heifers (springers) with older dry cows before calving.
- ☐ ☐ ☐ I avoid high somatic cell counts by keeping replacement heifers in a clean, dry environment.
- ☐ ☐ ☐ I discuss the incidence of clinical mastitis and dystocia rates in replacement heifers with my milk producer clients.
- ☐ ☐ ☐ I routinely seek feedback from my clients on their satisfaction with the animals they receive and use this information to improve my managment program.

MANAGEMENT TEAM REMARKS: _____

_____

Quality Control Point #8 - MEETING CONSUMER NEEDS FOR VERIFICATION (continued)

Best Management Practices/Standards Checklist

Yes/No/NA*

Pathogen Management

I review the following health issues or threats at least annually with my veterinarian and develop action plans where needed.

❑ ❑ ❑ *E. coli*	❑ ❑ ❑ *Clostridia*	❑ ❑ ❑ *Salmonella*
❑ ❑ ❑ *Chronic E. coli*	❑ ❑ ❑ *Cryptosporidia*	❑ ❑ ❑ *Coccidia*
❑ ❑ ❑ *Coronavirus*	❑ ❑ ❑ *Rotavirus*	❑ ❑ ❑ *Campylobacter*
❑ ❑ ❑ *Hairy Heel Warts*	❑ ❑ ❑ *Respiratory disease*	❑ ❑ ❑ *Mycoplasma*

❑ ❑ ❑ I post areas and ask visitors to check in before entering the heifer facility.

❑ ❑ ❑ My veterinarian talks to my client's veterinarian on biosecurity issues.

❑ ❑ ❑ I quarantine new animals for a minimum of 14 days before allowing them contact with other animals at my heifer operation.

❑ ❑ ❑ I (or the calf raiser) never allow replacement heifers on pastures where manure from mature animals has been spread. *(Organisms can live in the soil for up to one year.)*

❑ ❑ ❑ I require testing for and culling of "persistently infected" (PI) animals (BVD).

❑ ❑ ❑ My family and staff are aware that some diseases can cause disease in humans *(Giardia, Cryptosporidia, E. coli,* and some *Salmonella*).

Environmental Stewardship

❑ ❑ ❑ My manure management system provides a zero discharge of effluent into ground or surface water.

❑ ❑ ❑ I comply with local, state, and federal regulations to operate by obtaining proper permits.

❑ ❑ ❑ I have a phosphorus-based nutrient management program (special care when using Distillers Grains).

❑ ❑ ❑ I always maintain records of all manure and fertilizer applications to each field.

❑ ❑ ❑ I use proper buffer zones of trees, grasses, and/or wetland habitats by streams and other water courseways.

❑ ❑ ❑ I have a proactive public relations plan for my operation.

Animal Care

❑ ❑ ❑ My animals score 1 or 2 using the DQA Hygiene Scorecard (1 = clean, 4 = very dirty).

❑ ❑ ❑ My heifers are bred at appropriate size and age.

Breed	Age	Weight	Height at Wither
Jersey	14 months	550 lbs.	43"
	15 months	650 lbs.	45"
Holstein	15 months	800-875 lbs.	49-51"

❑ ❑ ❑ Locomotion scores of greater than 3 are kept below 3% of my animals (1 = normal, 5 = severely lame).

❑ ❑ ❑ My animals' body condition scores are appropriate for age (newborn 2.0; 6 months 3.0; 12 months 3.25; 15 months 3.5; and 24 months 3.75).

Calf Manager Training CD

Dykeman & Sons, Fultonville, NY

Reyncrest Dairy

The Reynolds Family, Corfu, NY

Dan and Sharon Rossiter, Belleville, NY

Koval Brothers Dairy, Stillwater, NY

Heifer Management Evaluation Snapshot – Two Components

Biological Advantage Scorecard (BAS)

Dykeman Case Farm

Factors Affecting Ability to Generate Profit & First Lactation Milk

Passive Immunity Achievement

- Blood IgG >10mg/ml ✓
  or Blood serum protein >5.5g/dl
  (at 48 hours of life)

≥85% achieving
(95% is achievable)
(86%* Dykeman)

**2 calves receiving colostrum replacement did not achieve*

Optimize Pre-Weaning Gains

- Double birth weight In 56 days

≥90% achieving
1.85x (avg.)
14%*
(Dykeman)
*Currently battling E Coli strain

Nail Biological Growth Targets

- 55% mature weight @ breeding
- 82 - 85% mature weight @ 1st calving

≥90% achieving
*Breeding: Avg. 56% MW
(69% Achieving)
*Calving: Avg. 78% MW
(14% Achieving)
(Dykeman)

What Makes a "Quality Heifer" -- Maintaining Management Momentum (Dykeman)

- 1st Calf "Treated" as Calf/Heifer* **≤ 30%** ?
  24 hrs. → 3 mos. ____ 4 mos. → fresh ____
- DOAs in first calf heifers **≤ 9%** **19%**
  Male DOAs **19%** Female DOAs **19%**
- 1st Calf avg. peak **≥ 80% of Mature** **71%**
  or total lactation **≥ 80% of Mature** **80%**
- 1st Calf Culls ≤ 60 Days in Milk **≤ 5%** **5%**
- 1st Calf ME's **≥ Mature** **< (-595)**
- 1st Calf "Treated" in Lactation* **≤ 15%** ?
- **≥ 85%** retention (any herd) to 2nd lactation **90%**
- **Reduce** #1 reason for 1st lactation culls (continuous improvement) **Repro**

Replacement Generation Capacity (RGC)*

Longer Term – Factors Affecting Asset Growth (IHG)

Herd Birth Rate

(Freshening events as % avg. cow nos.)
≥108%*
*distorted during expansion
(115% Dykeman)

% Heifers Born

(Female births divided by all births)
≥46 – 47%
(55 – 60% sexed semen)
(46% Dykeman)

% Heifers DOA (≤ 24 hrs.)

(Female births DOA divided by all births)
≤5%
(5% Dykeman)

Annualized Heifer Cull Rate

(Heifers died/culled divided by avg. # heifers)
≤3%*
*distorted during Expansion
24 hrs. → 3 mos. ____
4 mos. → fresh ____
(2% Dykeman)

Age at First Calving (Months)

(Age and standard deviation)
23 ± 2.5 mos. SD (& 82 – 85% Mature Wt.)
(23 ± 2.1 Dykeman)

*Adapted from Farm Credit's Business Consultants' *Heifer Management Index*